香港教育大學
The Education University of Hong Kong

大學正名十周年
The 10th Anniversary of the University's Retitling

Symposium on Data Science and Analytics (SDSA) 2026

Booklet

THE EDUCATION UNIVERSITY OF HONG KONG

Department of Mathematics and Information Technology

Contents

Rundown

13 May 2026

TIME	CONTENT	VENUE
2:00 PM – 5:00 PM	**Workshop** **The Life Cycle of Knowledge Agents: From Deep Parsing to Continuous Evolution** *Speaker:* ***Professor YANG Haiqin***	D3-LP-01

14 May 2026

TIME	CONTENT	VENUE
9:30 AM	**Opening Ceremony** ***Professor Ferrante NERI,*** *Dean of FLASS* ***Professor YU Leung Ho Philip****, Professor of MIT*	E-P-02M Room A
9:50 AM	**Keynote Speech 1** **Why Overfitting Works: Regularization, Ensembles, and High-Dimensional Learning** *Speaker:* ***Professor XIA Yingcun****, National University of Singapore* *Moderator:* ***Professor LI Wai Keung***	E-P-02M Room A
10:50 AM	**Break**	E-P (Foyer)

11:20 AM	**Parallel Sessions**	
	Adaptive AI: Vision, Health, and Planning *Speakers:* ***Dr LOU Rui Lorry**, City University of Hong Kong* ***Dr ZHAO Yang**, Sun Yat-sen University* ***Dr LI Xin**, The Education University of Hong Kong* *Organiser:* ***Dr LI Xin***	E-P-02M Room A
	Recent Advances in Complex Time Series *Speakers:* ***Professor SO Ka Pui Mike**, The Hong Kong University of Science and Technology* ***Professor ZHU Ke**, The University of Hong Kong* ***Professor LI Guodong**, The University of Hong Kong* *Organiser:* ***Professor YU Leung Ho Philip***	E-P-02M Room B
	The Application of Structural Equation Modeling in Educational and Psychological Studies *Speakers:* ***Dr KWAN Lok Yin Joyce**, The Education University of Hong Kong* ***Dr CHEUNG Sum Kwing Sam**, The Education University of Hong Kong* ***Dr TONG Xiuhong**, The Education University of Hong Kong* *Organiser:* ***Dr KWAN Lok Yin Joyce***	E-P-02M Room C
12:35 PM	**Lunch**	WESTERN RESTAURANT

2:00 PM	**Keynote Speech 2** **Mathematical theory of structured deep neural networks** *Speaker:* ***Professor ZHOU Dingxuan**, University of Sydney* *Moderator:* ***Dr LI Wenjuan***	E-P-02M Room A
3:00 PM	**Parallel Sessions**	
	Advances in Reliability Analysis and Risk Assessment *Speakers:* ***Professor NG Hon Keung Tony**, Bentley University* ***Professor HU Qingpei**, University of Chinese Academy of Sciences* ***Dr LING Man Ho**, The Education University of Hong Kong* *Organiser:* ***Dr LING Man Ho***	E-P-02M Room A
	Advances in Educational Data Analytics: Assessment, Systems, and Applications *Speakers:* ***Dr ZHU Jinxin**, The Education University of Hong Kong* ***Dr MAK Wai Kit**, Stewards Pooi Tun Secondary School* ***Dr WAN Marco**, The Polytechnic University of Hong Kong* *Organiser:* ***Ms XIE Yishan Ellen***	E-P-02M Room B
	Recent Advances in Statistical and Financial Machine Learning *Speakers:* ***Dr FAN Jiacheng**, The Polytechnic University of Hong Kong* ***Dr ZHONG Chong**, The Polytechnic University of Hong Kong* *Discussant:* ***Dr ZHANG Junyi***	E-P-02M Room C

4:15 PM	**Break**	E-P (Foyer)
4:45 PM	**Keynote Speech 3** **Beyond Scaling: Toward AGI through Embodiment and Agentic Intelligence** *Speaker:* ***Professor JING Bing-Yi**, Chinese University of Hong Kong-Shenzhen* *Moderator:* ***Dr WANG Yue***	E-P-02M Room A
5:45 PM	**Closing Ceremony** ***Dr LING Man Ho**, Associate Professor of MIT*	E-P-02M Room A
6:30 PM	**Dinner** *For invited guest only*	TSIM SHA TSUI

Workshop

TITLE	**The Life Cycle of Knowledge Agents: From Deep Parsing to Continuous Evolution**
DATE & TIME	**13 MAY 2026 - 2:00 PM**
VENUE	**D3-LP-01**
SPEAKER	**Professor YANG Haiqin**

Abstract

This workshop explores the "Life Cycle" of Knowledge Agents, tracing their evolution from data perception to continuous adaptation. The sessions are structured into three technical phases:

- Precision Perception: Advanced frameworks for aspect-level sentiment analysis and event extraction. We examine elegant methods to transform unstructured data into relational logic.
- Knowledge Internalization: Optimising the agent's "memory" through knowledge distillation methods and the mitigation of catastrophic forgetting. We detail the use of continual learning models to maintain robustness across various data.
- Interaction & Evolution: Analysing the transition to execution-aware scenarios and the nuances of multicultural alignment. The cycle concludes with model deployment and applications.

By integrating these stages, the workshop provides a structured roadmap for developing efficient, adaptive, and ethical AI agents.

Biographies

Dr Haiqin YANG is a Full Professor at the School of Artificial Intelligence, Shenzhen Technology University. He previously held positions as Principal Researcher at the International Digital Economy Academy (IDEA), Senior Researcher at Ping An Life, Machine Learning Scientist at Meitu, Adjunct Associate Professor at CUHK's Department of Decision Sciences and Managerial Economics, and Assistant Professor at Hang Seng Management College. He received his B.Sc. from Nanjing University and M.Phil. and Ph.D. in Computer Science and Engineering from CUHK. He is a Senior Member of IEEE and CCF.

His research focuses on Generative AI, Natural Language Processing, and Machine Learning—particularly large language models, knowledge-enhanced modeling, efficient scalable learning algorithms, and robust AI systems for business, government, and customer-oriented applications, which server one billion users. He has published over 100 refereed papers in top journals and conferences. His awards include the 2018 APNNS Young Researcher Award and three Aminer Most Influential Scholar Honorable Mentions (AAAI/IJCAI).

He served as Program Chair for IEEE/WI-IAT'24 and ICONIP'20, and has held senior roles (Area Chair, Senior PC, PC) at conferences including AAAI, IJCAI, ACL, EMNLP, ICML, NeurIPS, etc. He was ssociate Editor for Neurocomputing (2015–2020) and currently serves for Human-Centric Intelligent Systems. He received a Top Reviewer award at UAI'22.

Keynote Speech 1

TITLE	**Why Overfitting Works: Regularization, Ensembles, and High-Dimensional Learning**
DATE & TIME	**14 MAY 2026 - 9:50 AM**
VENUE	**E-P-02M - Room A**
SPEAKER	**Professor XIA Yingcun**

Abstract

Machine learning methods such as random forests and deep neural networks have demonstrated remarkable empirical success, particularly in high-dimensional settings. However, their theoretical foundations, especially in regimes involving overparameterization and massive model complexity, remain only partially understood.

This talk offers a personal, statistics-oriented perspective on modern machine learning, drawing on recent advances in the theory of large neural networks, ensemble learning, and high-dimensional regression. A central message is that model size alone does not determine generalization performance. Instead, appropriate regularization, whether explicit (e.g., path-norm penalties or spectral constraints) or implicit (through algorithmic structure or ensemble averaging), plays a decisive role in ensuring statistical consistency. In particular, we present recent results demonstrating that overparameterized deep neural networks can remain consistent even as their width grows arbitrarily large, provided suitable regularization is imposed.

We also discuss ensemble methods, including projection pursuit with feature bagging and random forests and their variants, which combine the strengths of classical statistical modeling and modern machine learning. These approaches can significantly improve empirical performance while maintaining strong theoretical guarantees.

Biographies

Professor XIA Yingcun is a Professor of Statistics at the National University of Singapore. He received his PhD in Statistics from the University of Hong Kong in 1999. His research interests include nonparametric regression and machine learning, time series analysis, and the statistical modeling of infectious diseases. He has served on numerous international review panels and committees, including NIH grant review panels, the New Zealand research assessment exercise, and the IASC–ARS Board of Directors. He has also served as an Associate Editor for leading journals, including the Annals of Statistics and the Electronic Journal of Statistics. His research has been widely recognized and featured in venues such as Nature News, JRSSB, and Statistical Science.

Keynote Speech 2

TITLE	**Mathematical theory of structured deep neural networks**
DATE & TIME	**14 MAY 2026 - 2:00 PM**
VENUE	**E-P-02M - Room A**
SPEAKER	**Professor ZHOU Dingxuan**

Abstract

Deep learning has been widely applied and brought breakthroughs in speech recognition, computer vision, natural language processing, and many other domains. The involved deep neural network architectures and computational issues have been well studied in machine learning. But there is much less theoretical understanding about the modelling, approximation or generalization abilities of deep learning models with network architectures. Important families of structured deep neural networks include deep convolutional neural networks induced by convolutions and transformers by attentions. The architectures give essential differences between such structured networks and fully-connected ones. This talk describes some approximation and generalization analysis of deep convolutional neural networks and transformers.

Biographies

Ding-Xuan ZHOU is a Professor and Head of School of Mathematics and Statistics, University of Sydney. Before moving to Australia, he was a Chair Professor at City University of Hong Kong, serving also as Director of the Liu Bie Ju Centre for Mathematical Sciences (2019-22), Associate Dean of School of Data Science (2018-22), and Head of Department of Mathematics (2006-12). His recent research is focused on theory of machine learning and deep neural networks. He received a Fund for Distinguished Young Scholars from NSF of China in 2005, and was rated in 2014-2017 by Thomson Reuters/Clarivate Analytics as a Highly-cited Researcher. His professional service includes being an Editor-in-Chief of the journals ``Analysis and Application'' and “Mathematical Foundations of Computing” and an editorial board member of more than ten journals.

Keynote Speech 3

TITLE	**Beyond Scaling: Toward AGI through Embodiment and Agentic Intelligence**
DATE & TIME	**14 MAY 2026 - 4:45 PM**
VENUE	**E-P-02M - Room A**
SPEAKER	**Professor JING Bing-Yi**

Abstract

The era of scaling has delivered remarkable capabilities, but more data and parameters alone are unlikely to produce AGI. The next leap requires a shift from passive pattern recognition to active, goal-directed understanding. This talk frames AGI as the convergence of two complementary paradigms: embodied intelligence, which grounds learning in the physical world but faces challenges in generalisation and real-world interaction, and agentic AI, which enables scalable perception, reasoning, and action in virtual environments through rapid iteration and simulation. Rather than competing, agentic systems offer an immediate path to capability and a laboratory for developing principles of intelligence, while embodiment provides the ultimate test of robustness and alignment. The central claim is that AGI will emerge from a virtuous loop between digital agency and physical experience, continuously refining world models and expanding what machines can understand and do—ultimately augmenting, rather than replacing, human intelligence.

Biographies

Professor. JING Bing-yi is the Duan Family Presidential Chair Professor of the School of Artificial Intelligence at the CUHK-Shenzhen and a Professor at the Shenzhen Loop Area Institute. He is a recipient of the National Distinguished Expert title, the Second Prize of the National Natural Science Award, and the Cheung Kong Scholars Chair Professorship from the Ministry of Education, as well as the Second Prize of the Ministry of Education's Natural Science Award. He is a Fellow of the American Statistical Association (ASA Fellow) and the Institute of Mathematical Statistics (IMS Fellow), and an Elected Member of the International Statistical Institute (ISI). He has served as Associate Editor for seven international journals, including Annals of Applied Probability, Journal of Business & Economic Statistics, and Science China.

His research interests span probability and statistics, econometrics, network data, reinforcement learning, bioinformatics, and artificial intelligence. He has published over 140 papers in leading journals and conferences, including Annals of Statistics, Annals of Probability, JASA, JRSSB, Biometrika, Journal of Econometrics, JBES, Bioinformatics, JMLR, Science China, NeurIPS, and ICLR. He has extensive industry collaboration experience and has received the Huawei Spark Award and the Huawei Outstanding Collaboration Achievement Award.

TITLE	Certifiable Perception: Generating Safety Maps via Conformal Segmentation
DATE & TIME	14 MAY 2026 - 11:20 AM
VENUE	E-P-02M - Room A
SPEAKER	Dr LOU Rui Lorry

Abstract

In safety-critical domains such as medical imaging and autonomous driving, standard image segmentation models often fail to provide reliable uncertainty quantification, leading to dangerous false negatives. While existing conformal risk control methods offer marginal coverage guarantees, they often perform inconsistently across diverse images—providing excessive coverage for simple inputs while failing to protect complex ones. In this talk, I introduce Conformal Risk Adaptation (CRA), a novel framework designed to enhance conditional risk control in segmentation by leveraging adaptive score functions that adjust prediction sets based on the difficulty of individual images. Furthermore, I present COAT (Conditional Optimal Adaptive Thresholding), an end-to-end differentiable optimization approach that learns to predict the optimal, image-specific threshold, effectively minimizing the risk gap. Our experiments demonstrate that these methods provide valid marginal risk control while significantly improving consistency in conditional risk performance, offering a robust, principled solution for high-stakes perception tasks.

TITLE	Personalized Health Monitoring via Integrating Multi-modal Sensor Technology and Artificial Intelligence
DATE & TIME	14 MAY 2026 - 11:20 AM
VENUE	E-P-02M - Room A
SPEAKER	Dr ZHAO Yang

Abstract

We introduce a new family of univariate/multivariate generalized Laguerred gamma (Glam) distributions for non-negative random variables. The Glam density is formed by twisting the generalized gamma density via the use of generalized Laguerre polynomials. We study the probabilistic properties of all Glam distributions, which are shown to have great distributional flexibility in learning complex non-negative data. Based on the Glam distributions, we then propose new Glam-based autoregressive conditional duration (ACD) models for financial duration data. Moreover, we construct new univariate/multivariate Glam regression models, leading to useful Glam-based heterogeneous autoregressive (HAR) models for realized volatility. As the first application, we demonstrate that the Glam-based ACD models outperform a range of benchmarks in learning the dynamics of volume duration data for six stocks in U.S. market. As the second application, we illustrate the usefulness of the Glam-based HAR models over their benchmark competitors for analyzing the realized volatility of two major stock indices.

TITLE	Integrated reinforcement and imitation learning for tower crane lift path planning
DATE & TIME	14 MAY 2026 - 11:20 AM
VENUE	E-P-02M - Room A
SPEAKER	Dr LI Xin

Abstract

Reinforcement learning (RL) has emerged as a promising solution method for crane-lift path planning. However, designing appropriate reward functions for tower crane (TC) operations remains particularly challenging. Poor design of reward functions can lead to non-executable lifting paths. This paper presents a framework combining imitation learning (IL) and RL to address the challenge. The framework comprises three steps: (1) designing a virtual environment consisting of construction site models and a TC model, (2) collecting expert demonstrations through virtual reality (VR) and pretraining through behavioral cloning (BC), and (3) refining the BC policies via generative adversarial imitation learning (GAIL) and proximal policy optimization (PPO). Using the paths generated by a PPO model as the baseline, the proposed BC + PPO + GAIL model exhibited better performance in both blind and nonblind lifting scenarios. This framework has been proven to generate realistic lifting paths mirroring crane operator behavior while ensuring efficiency and safety.

TITLE	Graphical Copula GARCH Modeling With Dynamic Conditional Dependence
DATE & TIME	14 MAY 2026 - 11:20 AM
VENUE	E-P-02M - Room B
SPEAKER	Professor SO Ka Pui Mike

Abstract

Modeling returns on large portfolios is a challenging problem since the number of parameters in the covariance matrix grows quadratically as the size of the portfolio increases. In this paper, we aim to develop a framework to model the nonlinear dependencies dynamically, namely the graphical copula GARCH (GC-GARCH) model. Motivated by the capital asset pricing model, one component of our model is independence among stock returns given some risk factors; this can greatly reduce the number of parameters, allowing the modeling of large portfolios. The joint distribution of the risk factors is factorized using a directed acyclic graph (DAG) with a pair-copula construction (PCC) to enhance the modeling of the tails of the return distribution while capturing complex dependent structures. The DAG induces topological orders to the risk factors which can be regarded as a list of directions of the flow of information. Dynamic conditional dependence structures are incorporated to allow the parameters in the copulas to be time varying. A three-stage estimation is used to estimate parameters in the marginal distributions, the risk factor copulas, and the stock copulas. The simulation study shows that the proposed estimation procedure effectively estimates the parameters and the underlying DAG structure with high accuracy. In the investment experiment presented in the empirical study, we show that the GC-GARCH model produces portfolios that, on average, yield higher returns, lower standard deviations, reduced turnover rates—indicating lower transaction costs—and greater diversification when compared to two competing copula-based models in the literature.

TITLE	A new family of generalized Laguerred gamma distributions: With applications in finance
DATE & TIME	14 MAY 2026 - 11:20 AM
VENUE	E-P-02M - Room B
SPEAKER	Professor ZHU Ke

Abstract

Nowadays, rapid advancements in sensor technology and artificial intelligence methods have led to integrated approaches that supports more effective and proactive elderly care. The intelligent approaches offer new solutions to identifying the individuals most in need of care, forming more reliable diagnosis of chronic diseases, triggering the interventions for a population in health risk, providing patients the consistently personalized healthcare, etc. However, there are still research gaps regarding how to implement, integrate and best use intelligent approaches to add value to healthcare consumers and providers. In this presentation, we will discuss various aspect about sensor-based data driven approaches to intelligent health monitoring and risk prediction, from system prototype design, data collection, to data modeling, in order to understand the most effective pathways from research to practical application to accelerate safe, informed and intelligent healthcare decision-making.

TITLE	High-dimensional Autoregressive Modeling for Time Series Data with Hierarchical Structures
DATE & TIME	14 MAY 2026 - 11:20 AM
VENUE	E-P-02M - Room B
SPEAKER	Professor Li Guodong

Abstract

Modern applications have made ubiquitous high-dimensional data, especially time-dependent data, with more and more complicated structures, and it also has become more frequent to encounter the scenario of hierarchical relationships among variables. However, there is still a lack of supervised learning tool in the literature for them. To fill this gap, we introduce a new model-designing framework, and it then combines with unsupervised factor modeling tools to form an efficient and interpretable autoregressive model for high-dimensional time series with hierarchical structures. An ordinary least squares estimation is considered, and its non-asymptotic properties are established. Moreover, we propose an algorithm to search for estimates, and a boosting method is also suggested for hyperparameter selection. Simulation experiments are conducted to evaluate finite-sample performance of the proposed methodology, and its usefulness is demonstrated by an application to the Personality-120 dataset. This project is coauthored with Lan Li, Shibo Yu and Yingzhou Wang.

TITLE	Conditional Path Analysis using Structural Equation Modeling
DATE & TIME	14 MAY 2026 - 11:20 AM
VENUE	E-P-02M - Room C
SPEAKER	Dr KWAN Lok Yin Joyce

Abstract

In this presentation, I will discuss the analysis of conditional path models that involve both moderation and mediation processes within the structural equation modeling (SEM) framework. Moderation and mediation analyses are widely used for understanding the interactive and dynamic nature of human behavior in educational and psychological research. Moderation analysis examines when and for whom psychological processes operate differently, whereas mediation analysis explains how and why human behavior emerges. This presentation will focus on conditional path models that integrate moderation and mediation with emphasis on model specification and interpretation. Specifically, I will demonstrate how to conduct conditional path analysis using SEM to address research questions involving moderated mediation and mediated moderation, using VS, an R package for analyzing conditional path models. Important methodological considerations in applying conditional path analysis within SEM, as compared with traditional regression-based approaches, are also discussed.

TITLE	Uncovering Pathways Between the Home Learning Environment and Young Children's Early Academic Skills: A Structural Equation Modeling Approach
DATE & TIME	14 MAY 2026 - 11:20 AM
VENUE	E-P-02M - Room C
SPEAKER	Dr CHEUNG Sum Kwing Sam

Abstract

The home learning environment comprises parents' beliefs, expectations, and attitudes concerning children's learning, along with their learning support practices provided to children beyond school. These diverse dimensions are closely associated with different early academic skills in young children. Given the multifaceted nature of both the home learning environment and early academic skills, structural equation modeling (SEM) is particularly well suited to research in this area. In this presentation, I will discuss studies that apply SEM in various ways to examine the mechanisms through which different aspects of the home learning environment contribute to young children's early academic skills, including the antecedents shaping the home learning environment. I will also highlight key methodological insights and practical considerations for designing structural equation models, particularly serial mediation models, in this line of research.

TITLE	Using Latent Growth, Mediation, Moderation, and Cross-Lagged Models to Examine Longitudinal Predictors and Underlying Mechanisms of Reading Comprehension Development
DATE & TIME	14 MAY 2026 - 11:20 AM
VENUE	E-P-02E - Room C
SPEAKER	Dr TONG Xiuhong

Abstract

In this presentation, I will introduce a series of studies that employ structural equation modeling (SEM) to examine the longitudinal predictors of reading comprehension development. Reading comprehension is a multifaceted skill that evolves over time, and understanding its developmental trajectory requires analytical approaches capable of modeling complex, causal relationships. The primary methods covered will include latent growth curve modeling (LGCM) to capture individual differences in initial status and growth rates; mediation analyses to investigate the mechanisms through which early skills (e.g., vocabulary) indirectly influence later comprehension; moderation analyses to explore how contextual (e.g., SES) alter the strength or direction of these relationships; and cross-lagged panel modeling (CLPM) to test reciprocal and directional influences between constructs over time, such as whether reading comprehension predicts subsequent related skills' growth or vice versa.

TITLE	Stochastic Modeling and Testing for Network Robustness and Reliability with Cybersecurity Applications
DATE & TIME	14 MAY 2026 - 3:00 PM
VENUE	E-P-02M - Room A
SPEAKER	Professor NG Hon Keung Tony

Abstract

Modern cyber infrastructures, such as the Internet, electronic payment systems, and peer-to-peer platforms, can be represented as complex networks whose functionality degrades as nodes fail or are removed. We introduce a modified Wiener process to model the stochastic evolution of a network-level robustness metric under adversarial attacks or random malfunctions. Building on this model, we develop three hypothesis-testing procedures to compare the risk and resilience of two networks. The proposed methodologies can be applied to any topological measures of network robustness or risk. Practical data analysis for the peer-to-peer file-sharing networks and the Enron email network are presented to illustrate the proposed model and methods. Monte Carlo simulations are used to evaluate the performance of the proposed methodologies and practical recommendations are provided.

TITLE	Data Analysis and Statistical Modeling for Remaining Useful Life Prediction of Complex Systems
DATE & TIME	14 MAY 2026 - 3:00 PM
VENUE	E-P-02M - Room A
SPEAKER	Professor HU Qingpei

Abstract

Remaining useful life prediction of complex systems during their life cycle operation is a prerequisite for effective preventive maintenance and spare parts decision-making. Accurate prediction results guarantee the formulation of appropriate strategies and decisions. For complex and highly reliable systems, modeling and inference based on key degradation failure modes have become fundamental approaches for fault prediction. Unlike binary lifetime data that only record success or failure, degradation data exhibit distinct characteristics across different types of products. Meanwhile, degradation data often suffer from low-quality features such as noise and missing values during acquisition and transmission due to various factors. How to perform data analysis and statistical modeling for degradation processes with special degradation patterns under low-quality data conditions has become the key issue for accurate RUL prediction. This report will provide a detailed overview of the research work conducted on this problem.

TITLE	Reliability Analysis of Accelerated Destructive Degradation Testing under Extended Gamma Process Model
DATE & TIME	14 MAY 2026 - 3:00 PM
VENUE	E-P-02M - Room A
SPEAKER	Dr LING Man Ho

Abstract

Accelerated degradation destructive testing (ADDT) has emerged as a valuable technique in reliability analysis, particularly for highly reliable products. This approach has garnered significant attention in the field of reliability research. A common characteristic observed in many degradation studies is the presence of randomness in the initial degradation levels of tested units. It is obvious that products with lower initial degradation levels tend to experience failure at an earlier stage. In light of this, an extended gamma process model specifically designed to analyze ADDT data with random initial degradation levels is presented in this talk. I will also present approximations for the conditional mean-time-to-failure and the variance of failure time for products exhibiting higher degradation levels. These approximations provide valuable insights to practitioners in terms of evaluating the impacts of different degradation levels on product reliability. Finally, an ADDT dataset of return-springs in a bi-functional DC motor system of an automobile is utilized to illustrate the proposed model and methodologies to make informed decisions regarding quality management and product performance.

TITLE	Self-Directed Learning-Oriented Assessment Practices Based on the Rasch Model: The ShinyTAM Platform
DATE & TIME	14 MAY 2026 - 3:00 PM
VENUE	E-P-02M - Room B
SPEAKER	Dr ZHU Jinxin

Abstract

Against the backdrop of educational assessment evolution and self-directed learning (SDL) development, this presentation illustrates self-directed learning-oriented assessment practices grounded in Rasch model. First, it reviews the developmental stages of assessment theories—assessment of learning, assessment for learning, and assessment as learning—and clarifies the core connotation of assessment as learning centered on student self-regulation and reflection. Second, it introduces the Rasch Model as a modern measurement theory, illustrating its advantages in locating students' zone of proximal development (ZPD), identifying unexpected responses, and enabling computerized adaptive testing (CAT) to support personalized assessment. Furthermore, it presents ShinyTAM, an online assessment analysis tool developed to implement Rasch model-based measurement, detailing its data processing, analysis, and result output functions for student- and teacher-level assessment applications. This presentation provides a theoretical framework and practical tool support for promoting student-centered, self-directed learning-oriented assessment reform.

TITLE	From Teacher-Selected to Self-Selected Quizzes: The Role of AI in Supporting STEM Assessment
DATE & TIME	14 MAY 2026 - 3:00 PM
VENUE	E-P-02M - Room B
SPEAKER	Dr MAK Wai Kit

Abstract

This study examines how quiz selection autonomy affects STEM learning outcomes among 126 secondary students transitioning from teacher-selected to AI-assisted to self-selected assessments. Results reveal an "Autonomy Paradox" where performance declined as freedom increased, yet self-efficacy remained stable. AI-assisted selection emerged as an optimal middle ground, functioning as a cognitive scaffold that preserves the motivational benefits of choice while mitigating performance drops in STEM assessment.

Results reveal a significant stepwise decline in academic performance as autonomy increased, uncovering an "Autonomy Paradox" where high-achievers under structured conditions struggled most in autonomous settings. Interestingly, STEM self-efficacy remained stable across all phases, suggesting that the agency provided by AI and self-selection acts as a psychological buffer. These findings highlight the critical role of AI as a cognitive scaffold in the Zone of Proximal Development, facilitating a shared-regulation model that balances learner agency with academic achievement.

TITLE	**From Problem Discovery to Structural Design: Leveraging AI in Secondary Mathematical Modeling Education — A Case Study of the "Tower to the Sky" Challenge**
DATE & TIME	**14 MAY 2026 - 3:00 PM**
VENUE	**E-P-02M - Room B**
SPEAKER	**Dr WAN Marco**

Abstract

This presentation explores the transformative potential of Artificial Intelligence (AI) in secondary mathematical modeling education, drawing insights from the "Tower to the Sky" AI mathematical modeling competition organized by the Hong Kong Educational Equipment Industry Association (HKEEIA).

TITLE	**Realization utility, market regimes, and the disposition effect**
DATE & TIME	**14 MAY 2026 - 3:00 PM**
VENUE	**E-P-02M - Room C**
SPEAKER	**Dr FAN Jiacheng**

Abstract

We study a model of realization utility in a financial market where the drift of the stock switches between a bull and a bear market driven by a hidden Markov chain. An investor trading between a risky, regime-switching stock and a risk-free bond seeks to determine an optimal sequence of purchasing and selling times for the stock to balance utility bursts experienced when realizing a gain or loss with utility derived from terminal wealth. We characterize the optimal value functions when holding the bond and stock, respectively, as the unique solutions to a system of coupled HJB equations and obtain optimal holding and selling regions for the bond and stock. The presence of market regimes and preferences incorporating realization utility have opposite effects on trading behavior: Models of realization utility without market regimes predict extreme versions of the disposition effect, while a model incorporating market regimes but not realization utility predicts trend following strategies, i.e., the opposite of the disposition effect. Including both features generates a rich set of trading behavior including voluntarily realizing gains and losses with optimal liquidation points depending on the assessment of the market state, selling of the stock with or without immediate repurchase, and reasonable levels of the disposition effect and other statistics conforming with recorded behavior of individual investors.

TITLE	**Copula-enhanced convolutional neural network in joint prediction of myopia and axial-length**
DATE & TIME	**14 MAY 2026 - 3:00 PM**
VENUE	**E-P-02M - Room C**
SPEAKER	**Dr ZHONG Chong**

Abstract

The ultra-widefield (UWF) fundus image is an attractive 3D biomarker in AI-aided myopia screening because it provides much richer myopia-related information. Though axial length (AL) has been acknowledged to be highly related to the two key targets of myopia screening, spherical equivalence (SE) measurement and high myopia diagnosis, its prediction based on the UWF fundus image is rarely considered. To save the high expense and time costs of measuring SE and AL, we propose the Copula-enhanced Convolutional Neural Network (CeCNN), a one-stop UWF-based ophthalmic AI framework to jointly predict SE, AL, and myopia status. The CeCNN formulates a mul- tiresponse regression that relates multiple dependent discrete-continuous responses and the image covariate, where the nonlinearity of the association is modeled by a backbone CNN. To thoroughly describe the dependence structure among the responses, we model and incorporate the conditional dependence among responses in a CNN through a new copula-likelihood loss. We provide statistical interpretations of the conditional dependence among responses and reveal that such dependence is beyond the dependence explained by the image covariate. We heuristically justify that the proposed loss can enhance the estimation efficiency of the CNN weights. We apply the CeCNN to the UWF dataset collected by us and demonstrate that the CeCNN sharply enhances the predictive capability of various backbone CNNs. Our study supports the ophthalmology view that, besides SE, AL is an important measure of myopia.

General Information about the Symposium on Data Science and Analytics

Talks

All local speakers will deliver their talks in lecture theatres or classrooms at The Education University of Hong Kong. Participants are requested to arrive at the venue before the scheduled start time of each session to avoid any disturbance.

Internet access

All delegates from outside The Education University of Hong Kong will be provided with access to the EdUHK Wi-Fi network. Please connect to the SSID "Wi-Fi.HK via EdUHK" to enjoy free Wi-Fi service in public areas of the University. To ensure fair usage of network resources, each session is limited to ten hours.

Catering

Outlet	Location	Opening Hours (Weekday)
The Cove View (Canteen)	Podium, Block B4-C	7:30 am – 8:30 pm
Western Restaurant	Podium, Block C	11:00 am – 3:00 pm
Chinese Restaurant	Podium, Block B4	11:00 am – 3:00 pm
U Deli (Coffee Corner)	G/F, Block B4	8:00 am – 6:30 pm
7-11 Convenience Store	Podium, Block C	7:30 am – 11:30 pm
Food Kiosk	G/F, Block B4	8:00 am – 3:00 pm

Official event website

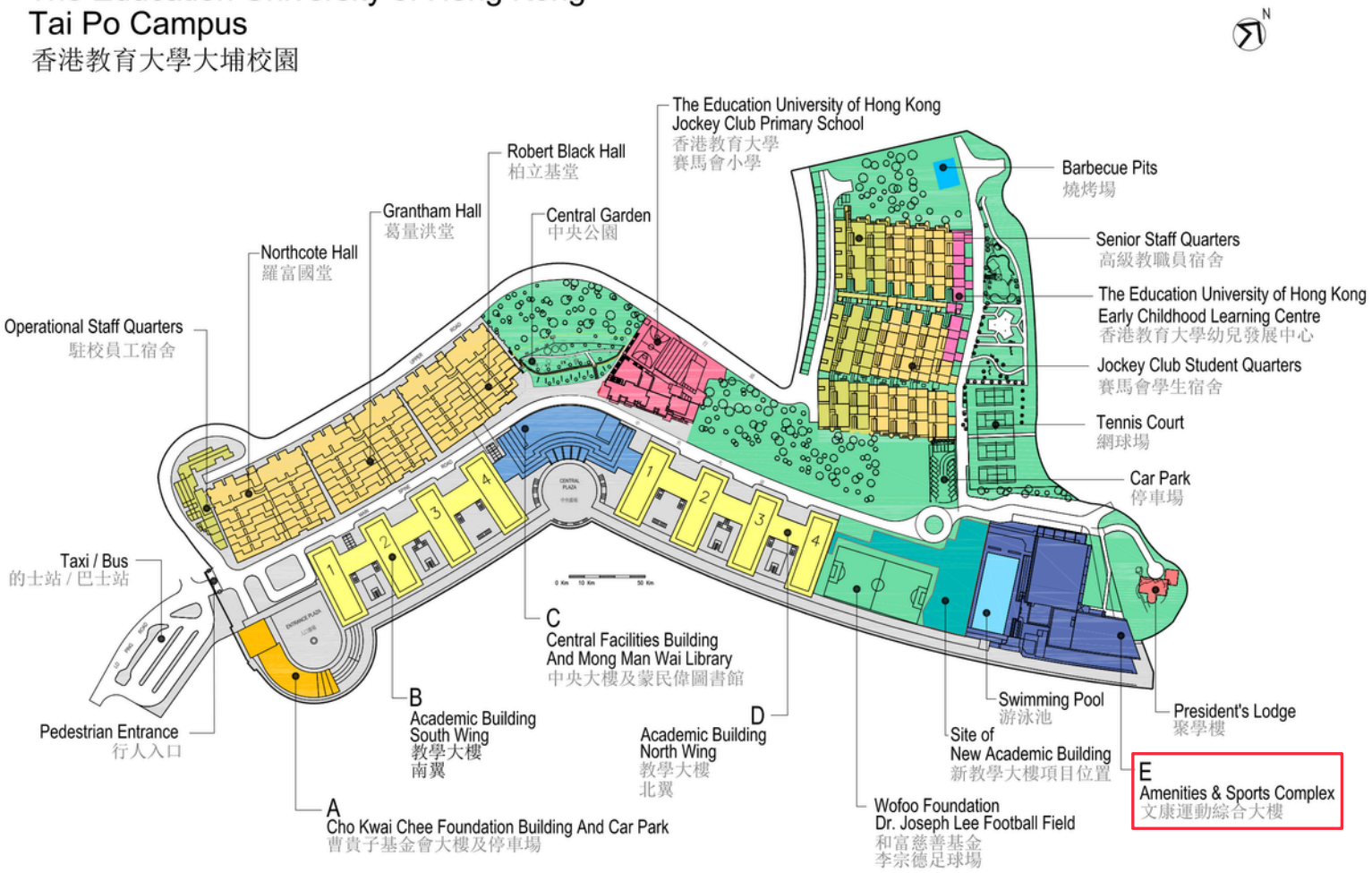
https://www.eduhk.hk/mit/en/event/sdsa2026

Enquiries

Phone: 2948 7824
Email: mit@eduhk.hk

Campus Map

The Education University of Hong Kong
Tai Po Campus
香港教育大學大埔校園



SCALE 1 : 2500
(in A3 paper size)

Floor Plan


E-P-16
E-P-15
E-P-14
E-P-13
E-P-12
E-P-10
E-P-09A
E-P-09B
E-P-04A
E-P-04B
E-P-04C
E-P-05
E-P-03B
E-P-02B2
E-P-02B1
E-P-01B
E-P-T1
E-P-T3
E-P-T2
E-P-11
E-P-02M
Room A
E-P-02M
Room C
E-P-02M
Room B

Notes